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CLAIMS

We claim:

- ~~1. A T helper cell epitope selected from the group consisting of SEQ ID NOS: 6-22, 105, 123, 124, 31-35.~~

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2. A T helper cell epitope according to Claim 1 for preparing a peptide immunogen represented by the formula

(A)_n-(Target antigenic site)-(B)_o-(Th)_m~~/X~~

or

(A)_n-(Th)_m-(B)_o-(Target antigenic site)-X

or

$$(A)_n--(B)_o(Th)_m-(B)_o-(\text{Target antigenic site})-X$$

0.8

(Target antigenic site)-(B)_o-(Th)_m-(A)_n-X

0.7

$$(\text{Th})_m - (\text{B})_o - (\text{Target antigenic site}) - (\text{A})_n - \text{X}$$

wherein:

A is an amino acid or a general immunostimulatory sequence, where n is more than one, the individual A's may be the same or different;

B is selected from the group consisting of amino acids, -HCH(X)CH₂SCH₂CO-, -NHCH(X)CH₂SCH₂CO(□-N)Lys-, -NHCH(X)CH₂S-succinimidyl(□-N)Lys-, and -NHCH(X)CH₂S-(succinimidyl)-;

Th is an artificial helper T cell epitope selected from the group consisting of SEQ ID NOS:6-22, 105, 31-35 or an analog thereof;

"Target antigenic site" is a B cell epitope, a peptide haptén, or a immunologically reactive analog thereof;

30 X is amino/acid α -COOH or CONH₂ ;

n is from 1 to about 10;

m is from 1 to about 4; and

~~o~~ is from 0 to about 10.

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3. A peptide immunogen according to claim 2 wherein the immunostimulatory sequence is SEQ ID NO:78.
- 5 4. A peptide immunogen according to Claim 2 wherein B is selected from the group consisting of Gly-Gly, (\square -N)Lys, Pro-Pro-Xaa-Pro-Pro, -NHCH(X)CH₂SCH₂CO-, -NHCH(X)CH₂SCH₂CO(\square -N)Lys-, -NHCH(X)CH₂S-succinimidyl(\square -N)Lys-, and -NHCH(X)CH₂S-(succinimidyl)-.
- 10 5. A peptide immunogen according to Claim 4 wherein B is Gly-Gly.
6. A peptide immunogen according to Claim 4 wherein B is (\square -N)Lys.
- 15 7. A peptide immunogen according to ~~Claim 1, 2, 3, 4, 5, or 6~~ wherein the the Target Antigen site is the *Plasmodium falciparum* repeating antigen:
(Asn-Ala-Asn-Pro)_p
(SEQ ID NO:103).
- 20 8. A peptide immunogen according to Claim 7 wherein p=4.
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25 ~~9. A peptide immunogen according to Claim 7 selected from the group consisting of SEQ ID NOS: 104, 105.~~
10. A peptide immunogen according to Claim 1, 2, 3, 4, 5, or 6 wherein the the Target Antigen site is selected from the group consisting of SEQ ID NO: 106, 107, 108, and 109, an epitope of CETP.
- 30 *Sub. 93*
~~11. A peptide immunogen according to Claim 10 selected from the group consisting of SEQ ID NOS:110 - 119.~~

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12. A peptide immunogen according to Claim 1, 2, 3, 4, 5, or 6 wherein the the Target Antigen site is selected from the group consisting of SEQ ID NOS: 125, 131, 132, 133, 134, and 135, an epitope of HIV.

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- ~~13. A peptide immunogen according to Claim 12 selected from the group consisting of SEQ ID NOS:126 - 129, 136-151.~~

Sub. 94

14. A peptide immunogen according to Claim 13 selected from the group consisting of SEQ ID NOS:148 - 151.

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15. A method for producing a peptide immunogen by covalently linking a T helper cell epitope to a target antigenic site selected from the group consisting of B cell epitopes of an antigen and a peptide hapten.

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16. A method for producing a peptide immunogen according to Claim 15 further linking the covalently linked T helper cell epitope and target antigenic site to an immunostimulatory sequence.

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17. A method for producing a peptide immunogen according to Claim 16 wherein the immunostimulatory sequence is SEQ ID NO:78.

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18. A method for producing a peptide immunogen according to Claim 17 wherein B is selected from the group consisting of Gly-Gly, (\square -N)Lys, Pro-Pro-Xaa-Pro-Pro, -NHCH(X)CH₂SCH₂CO-, -NHCH(X)CH₂SCH₂CO(\square -N)Lys-, -NHCH(X)CH₂S-succinimidyl(\square -N)Lys-, and -NHCH(X)CH₂S-(succinimidyl)-.

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19. A method for producing a peptide immunogen according to Claim 18 wherein B is Gly-Gly.

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20. A method for producing a peptide immunogen according to Claim 19 wherein B is (\square -N)Lys.
- 5 21. A method of inducing T helper cell response by employing a peptide immunogen of claim 1.
22. A method of inducing T helper cell response by employing a peptide immunogen of claim 2.
- 10 23. A method of inducing T helper cell response by employing a peptide immunogen of claim 3.
24. A method of inducing T helper cell response by employing a peptide immunogen of claim 4.
- 15 25. A method of inducing T helper cell response by employing a peptide immunogen of claim 5.
- 20 26. A method of inducing T helper cell response by employing a peptide immunogen of claim 6.
27. A method of inducing T helper cell response by employing a peptide immunogen of claim 7.
- 25 28. A method of inducing T helper cell response by employing a peptide immunogen of claim 8.
29. A method of inducing T helper cell response by employing a peptide immunogen of claim 9.
- 30 30. A method of inducing T helper cell response by employing a peptide immunogen of claim 10.
- 35 31. A method of inducing T helper cell response by employing a peptide immunogen of claim 11.

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